Protocol
C-2c

SECTION: C-2c

TITLE: Adult Cardiopulmonary Arrest – ALS Algorithms

REVISED: August 1, 2013

Adult Cardiopulmonary Arrest – ALS

Box #1:

If adequate CPR is being performed upon arrival:

a) Confirm cardiopulmonary arrest and, if necessary, continue CPR.
b) Apply defibrillation pads and cardiac monitor without cessation of CPR.
c) Move on to, **"Box 4."**

Box #2:

Sudden, witnessed arrest in the presence of EMS:

a) Perform CPR only long enough to apply defibrillation pads and cardiac monitor.
b) Move patient to Long Backboard as soon as possible/feasible
c) Move on to, **"Box 4."**

Box #3:

If inadequate CPR, or no CPR at all, is being performed upon arrival:

a) Initiate CPR
b) 5 cycles 30 compressions to 2 ventilations (approximately 2 minutes)
c) During CPR:
   1) Apply defibrillation pads and cardiac monitor.
   2) Prepare for endotracheal intubation.
   3) Prepare IV/IO equipment.
   4) Move on to, **"Box 4."**

Box #4:
Rhythm Check

VF/Pulseless VT:

a) Continue CPR while defibrillator charges.
b) **Shock @ manufacturer's recommendation.**
c) Immediately resume CPR without pause for rhythm check.
d) Perform 5 cycles 30:2 (approx. 2 min)
e) Intubate without cessation of compressions.

Asystole/PEA:

a) No shock indicated.
b) Immediately resume CPR.
c) 5 cycles 30:2 (approx. 2 min)
d) Intubate without cessation of compressions.

Protocol C-2c

Adult Cardiopulmonary Arrest – ALS

Box #5: Rhythm Check

VF/Pulseless VT:

a) Shock @ manufacturer's recommendation.

- Continue CPR while defibrillator charges.

b) Immediately administer 2 minutes of asynchronous CPR without pause for rhythm check.

c) Obtain IV/IO access without cessation of compression

d) Assess BG

MEDICATION ADMINISTRATION DURING CPR:

e) IV/IO 1:10,000 epinephrine:

1) 1 mg with saline flush.

2) Repeat every 3-5 minutes as needed

OR:

f) ETT 1:1,000 epinephrine:

1) If unable to obtain IV/IO access.

2) 2-2.5 mg diluted to 10 ml with NS.

3) Repeat every 3-5 minutes as needed.

Asystole/PEA:

a) No shock indicated.
b) Immediately administer 2 minutes of asynchronous CPR without pause for rhythm check.
c) Obtain IV/IO access.
d) Assess BG or BGL.

MEDICATION ADMINISTRATION DURING CPR:

e) IV/IO 1:10,000 epinephrine:
1) 1 mg with saline flush
2) Repeat every 3-5 minutes as needed.

OR:

- **ETT 1:1,000 epinephrine:**
  3) If unable to obtain IV/IO access.
  4) 2-2.5 mg diluted to 10 ml with NS.
  5) Repeat every 3-5 minutes as needed.

Protocol
C-2c

Adult Cardiopulmonary Arrest – ALS

Box #6:
Rhythm Check

VF/Pulseless VT:

a) **Shock @ manufacturer's recommendation**.
   - Continue CPR while defibrillator charges.

b) Immediately administer 2 minutes of asynchronous CPR without pause for rhythm check.

c) ***MEDICATION ADMINISTRATION DURING CPR:***

d) **IV/IO Amiodarone:**
   1) 300 mg initial dose. Consider repeat 150 mg 3-5 min after.

e) **IV/IO 2% lidocaine:**
   1) 1-1.5 mg/kg with 20 ml NS flush.
   2) Repeat every 3-5 minutes as needed. Max dose 3 mg/kg

OR:

- **ETT 2% lidocaine:**
   3) If unable to obtain IV/IO access.
   4) 2-3 mg/kg.
   5) Repeat every 3-5 minutes as needed. Max dose 3 mg/kg

f) **Lidocaine maintenance infusion:*****
   1) If, following lidocaine therapy, dysrhythmia is terminated.
   2) 2-4 mg/min.
   3) Using 4 mg/ml solution:
      i. 1 mg/kg bolus total=2 mg/min.
      ii. 2 mg/kg bolus total=3 mg/min.
      iii. 3 mg/kg bolus total=4 mg/min.

g) **IV/IO magnesium sulfate:**
   1) 1-2 g bolus (may repeat every 5 min. prn.)
   2) First-line in torsades.
   3) Administer in conjunction with lidocaine if hypomagnesemia suspected.
   4) Consider for refractory VF/pulseless VT.

During CPR

- **Push hard & fast (100/min)**
- **Ensure full chest recoil**
- **Minimize interruptions in chest compressions**
- One cycle of CPR: 30 compressions to 2 breaths; 5 cycles ≈ 2 min
- Avoid hyperventilation
- Secure airway & confirm placement
- Rotate compressions every 2 minutes with rhythm checks
- Search for & treat possible contribution factors:
   - **H**ypovolemia
   - **H**ypoxia
   - **H**ydrogen ion (acidosis)
   - **H**ypo-/hyperkalemia
   - **H**ypothermia
   - **T**oxins
   - **T**amponade, cardiac
   - **T**ension Pneumothorax
   - **T**hrombosis (coronary or pulmonary)

* After an advanced airway is placed, rescuers no longer deliver "cycles" of CPR. Give continuous chest compressions without pauses for breaths. Give 8 to 10 breaths/minutes. Check rhythm every 2 minutes.

Continue the following:

CPR → RHYTHM CHECK → CPR (if necessary while defibrillator charges) → SHOCK (if indicated) → CPR AND MEDICATION ADMINISTRATION

Continue this sequence until:

a) Transport/transfer of care is complete.
b) Resuscitative efforts are terminated.
c) A rhythm change occurs.

If a rhythm change occurs, treat according to its respective algorithm, starting at the top of that algorithm.

Additional pharmacologic therapies:

a) IV/IO Sodium bicarbonate: 1 mEq/kg for known hyperkalemia, acidosis (DKA, TCA), prolonged resuscitation after ROSC. Flush line thoroughly before and after administration. Repeat @ ½ the dose in 10 minutes.

1) If cyclic antidepressant OD suspected, rebolus in 5-10 minutes at 0.5 mEq/kg.

b) IV/IO Calcium chloride: 500-1000 mg for suspected hyperkalemia or calcium channel blocker overdose. Flush line thoroughly before and after administration.

c) Albuterol: For suspected hyperkalemia. ETT: 10 mg (4 unit doses) directly instilled into the ETT followed by brief hyperventilation.

d) IV/IM/IO/IN Narcan (naloxone): 2 mg for suspected opiate overdose.

e) IV/IO Dextrose: 12.5- 25 g if coexisting hypoglycemia present.

Physician Pearls:

AHA guidelines recommend Amiodarone as “first line” in pulseless VT/VF.